

Meteorological Data

The official data, hereunder, on precipitation and temperatures for various points on possible routes of the British Columbia - Yukon - Alaska Highway have been supplied the Commission by the Office of the Dominion Meteorological Service at Toronto. The latter Service, at the request of the Commission, further supplied special information regarding dates of first snowfalls in any one year and maximum depth of snow on the ground at any one time.

The meteorological information included in this report has considerable value in the consideration of advantages or disadvantages of different routes.

Table No. 2

Ullin B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
<i>Mean Maximum Temperature</i>													
1934	2.6	29.9	32.8	46.9	54.8	62.8	66.4	63.4	54.5	43.6	27.5	14.9	
35	3.4	30.3	21.6	40.9	50.4	59.0	63.1	59.7	55.1	39.4	26.2	19.0	
36	3.6	9.4	29.9	44.4	54.9	69.8	64.8	67.4	51.4	49.3	41.2	15.8	
37	21.6	16.4	32.0	41.1	51.4	61.9	58.2	58.3	55.7	44.9	26.0	12.0	
38	12.0	7.8	29.9	42.7	51.0	57.3	61.6	63.7	58.7	46.7	32.5	22.1	
<i>Mean Minimum Temperature</i>													
1934	-8.4	17.2	12.9	27.8	34.3	38.9	45.2	44.2	36.7	31.3	18.6	4.9	
35	-1.5	17.0	2.3	24.8	31.1	39.4	44.1	41.2	37.6	23.3	12.9	10.6	
36	-11.1	-30.4	14.2	25.5	34.2	45.4	45.2	43.9	36.9	37.5	29.7	4.9	
37	3.0	2.4	15.3	24.0	32.2	37.2	36.3	38.4	40.4	34.2	16.1	0.8	
38	0.0	4.4	12.5	26.9	33.3	37.9	40.1	42.9	43.8	34.9	24.2	11.3	
<i>Extreme Max.</i>	44.0	45.0	47.5	62.0	80.0	87.0	83.0	76.4	79.5	66.0	52.0	49.0	
<i>Extreme Min.</i>	-50.0	-51.5	-24.0	-11.0	22.0	28.0	30.0	29.0	18.0	-16.0	-17.0	-30.0	
<i>Rainfall</i>													
1934	0.89	0.02	0.08	0.32	0.42	0.12	0.87	2.92	0.92	0.62	T	0.09	
35	0.27	0.16	0.00	0.00	0.71	1.91	2.27	1.50	0.35	0.26	0.74	0.41	
36	0.00	0.00	0.02	0.00	0.40	1.13	2.33	0.17	1.53	2.26	2.12	0.15	
37	0.00	0.00	T	0.00	0.08	1.08	1.52	1.28	1.68	2.23	0.00	0.69	
38	0.06	1.05	0.00	0.04	0.10	0.63	0.34	0.80	0.85	0.88	0.10	0.00	
<i>Snowfall</i>													
1934	28.6	11.7	3.6	T					0.1	T	6.2	4.5	
35	7.3	4.2	9.3	2.2	10				0.4	6.9	17.5	14.5	
36	7.5	7.5	1.0	5.4						0.2	4.6	5.7	
37	4.4	3.3	4.6	0.8							2.9	7.1	
38	14.7	5.0	2.8	5.9	T					1.0	7.8	7.6	

Table No. 2

Astoria B. C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Total Precipitation</i>												
1934	3.75	1.19	0.44	0.32	0.42	0.12	0.87	2.92	0.93	0.62	0.62	0.54	
35	1.00	0.58	0.93	0.22	0.81	1.91	2.27	1.50	0.37	0.93	2.49	2.06	
36	0.75	0.75	0.12	0.54	0.40	1.13	2.33	0.17	1.33	2.28	2.58	0.72	
37	0.44	0.33	0.46	0.08	0.08	1.05	1.52	1.28	1.63	2.23	0.24	1.40	
38	1.33	1.55	0.28	0.63	0.10	0.63	0.34	0.80	0.85	0.98	0.83	0.76	
	<i>Earliest Measurable Snowfall</i>												
1934	September 20 <sup>th</sup>		1/10 Inch			next snowfall				November 9 <sup>th</sup>			
35	September 22 <sup>nd</sup>												
36	October 21 <sup>st</sup>												
37	November 5 <sup>th</sup>												
38	October 31 <sup>st</sup>												
	<i>Maximum Snow on Ground (Estimated)</i>												
1934	32		Inches										
35	24		"										
36	42		"										
37	15		"										
38	26		"										



Table No. 2

	<i>Searcross Yukon</i>												
	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Mean Maximum Temperature</i>												
1934								66.0	54.5	43.5	25.5	10.5	
35	-0.2	28.6	20.9	41.3	-	-	-	60.2	54.8	36.6	22.1	15.0	
36	1.9	10.2	30.5	44.2	55.7	71.0	68.2	67.4	51.9	48.1	39.9	10.5	
37	18.8	12.3	31.0	41.1	53.2	66.8	64.2	62.1	57.3	44.8	21.8	8.4	
38	8.0	6.6	30.8	43.3	54.6	61.0	66.6	67.8	61.1	47.6	30.0	17.1	
	<i>Mean Minimum Temperature</i>												
1934								44.0	31.5	26.5	12.5	-2.5	
35	-16.4	8.1	-4.2	19.3	-	-	-	37.6	31.3	19.1	5.6	-1.5	
36	-15.1	-33.6	5.1	19.9	29.6	41.8	42.6	39.5	31.2	30.5	25.4	-6.1	
37	-4.5	-10.5	7.7	18.9	27.6	35.7	37.8	38.1	34.6	27.8	6.4	-9.2	
38	-10.0	-10.3	1.6	19.1	27.7	33.4	36.9	35.3	36.2	27.2	9.9	-1.1	
<i>Extreme Max.</i>	44	51	47	56	82	89	80	80	80	62	53	49	
<i>Extreme Min.</i>	-49	-54	-32	-10	14	23	25	26	8	-22	-31	-49	
	<i>Rainfall</i>												
1934								1.30	0.23	0.15	0.00	0.00	
35	0.07	0.00	0.00	0.00	0.25	1.58	1.51	1.51	1.10	0.00	0.00	0.00	
36	0.00	0.00	0.00	0.00	0.20	0.94	1.63	0.94	1.00	1.97	1.25	0.00	
37	0.00	0.00	0.00	-	-	0.54	1.12	1.48	0.87	1.21	0.00	0.00	
38	0.00	0.50	0.00	0.00	0.09	0.16	0.22	1.30	0.76	0.25	0.00	0.00	
	<i>Snowfall</i>												
1934											2.5	3.0	
35	2.5	5.0	11.5	3.0	0.5					1.0	4.5	11.0	
36	5.8	1.8	0.8	1.0					6.0	2.5	6.5	5.0	
37	3.5	7.3	2.1								7.8	7.3	
38	5.0	11.5	3.0							5.5	5.5	5.0	





Table No. 2

Dawson City Yukon

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Mean Maximum Temperature</i>												
1934	-22.0	12.8	18.0	44.2	58.8	69.0	71.7	63.0	51.2	33.3	8.5	1.1	
35	-19.4	8.4	11.5	40.2	55.1	67.8	73.2	61.3	51.5	27.2	0.8	6.9	
36	-15.5	-23.5	17.9	41.1	61.3	76.7	72.8	70.0	49.9	34.4	13.6	15.2	
37	5.1	-5.3	20.5	39.7	58.4	74.2	68.9	61.0	56.3	27.4	12.9	8.3	
38	-13.9	-14.5	21.9	45.3	59.2	67.0	70.8	68.3	62.1	44.2	10.3	5.8	
	<i>Mean Minimum Temperature</i>												
1934	-38.3	-3.9	-10.0	20.2	36.5	41.2	47.4	46.0	30.6	22.0	-3.0	-13.9	
35	-34.2	-7.9	17.2	17.6	31.7	42.4	46.3	39.7	30.5	13.1	-12.2	-20.3	
36	-28.5	-40.5	8.4	11.0	33.9	46.2	46.6	45.4	31.2	23.2	1.6	-29.2	
37	-14.9	-20.5	3.5	20.4	32.9	45.0	45.2	42.4	37.3	28.5	2.2	21.3	
38	-27.1	-29.5	-7.0	19.4	34.4	41.3	47.6	42.7	38.5	30.8	-1.4	-16.6	
<i>Extreme Max</i>	35.0	48.0	46.0	62.5	83.0	90.5	84.5	82.5	77.0	62.0	34.0	55.0	
<i>Extreme Min</i>	-66.0	-58.0	-46.0	-22.0	9.0	27.0	31.5	26.0	14.0	-22.0	-41.0	-56.0	
	<i>Rainfall</i>												
1934	0.00	0.00	0.00	0.87	2.29	1.38	1.53	2.39	0.82	0.06	0.00	0.54	
35	0.00	0.00	0.00	0.12	2.13	1.47	1.29	1.69	0.63	0.01	0.00	0.00	
36	0.00	0.00	0.00	0.00	2.78	0.94	1.30	1.25	0.29	1.25	0.00	0.00	
37	0.00	0.00	0.00	T	0.96	0.96	1.51	3.15	1.87	0.78	0.00	0.00	
38	0.00	0.00	0.00	0.02	0.79	1.25	3.17	1.13	1.11	0.66	0.00	0.00	
	<i>Snowfall</i>												
1934	8.1	7.2	5.3	1.7	0.1				0.8	7.7	7.7	5.9	
35	6.0	2.3	1.8	4.6					7.2	9.5	10.7	11.8	
36	1.7	1.0	11.3	1.0						16.8	21.7	13.6	
37	29.4	4.9	1.4	1.5						0.8	3.5	7.3	
38	7.3	0.7	11.2	0.8						1.0	16.0	8.2	

Table No. 2

Dawson City Yukon

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Total Precipitation</i>												
1934	0.81	0.72	0.53	1.04	2.30	1.38	1.53	2.39	0.90	0.83	0.77	1.13	
35	0.60	0.23	0.18	0.58	2.13	1.47	1.29	1.69	1.35	0.96	1.07	1.15	
36	0.17	0.10	1.13	0.10	2.78	0.94	1.30	1.25	0.29	2.93	2.17	1.36	
37	2.94	0.49	0.14	0.15	0.96	0.96	1.51	3.15	1.57	0.86	0.35	0.73	
38	0.73	0.07	1.12	0.10	0.79	1.25	3.17	1.13	1.11	0.76	1.60	0.82	
	<i>Earliest Measurable Snowfall</i>												
1934	<i>September</i>			<i>22<sup>nd</sup></i>									
35	<i>September</i>			<i>22<sup>nd</sup></i>									
36	<i>October</i>			<i>3<sup>rd</sup></i>									
37	<i>October</i>			<i>7<sup>th</sup></i>									
38	<i>October</i>			<i>11<sup>th</sup></i>									
	<i>Greatest depth Snow on Ground (Estimated)</i>												
1934	<i>40</i>		<i>inches</i>										
35	<i>28</i>		<i>"</i>										
36	<i>36</i>		<i>"</i>										
37	<i>58</i>		<i>"</i>										
38	<i>24</i>		<i>"</i>										



Table No. 2

Figures from Geological Survey

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
1887		Observations in Yukon and adjacent parts of B.C. General location of the Party											
June		1 <sup>st</sup>	Tahltan Bridge basear Trail										
		5 <sup>th</sup>	Head Dease Lake										
		16 <sup>th</sup>	Laketon										
		29 <sup>th</sup>	Francis River										
July		5 <sup>th</sup>	Francis Lake										
		17 <sup>th</sup>	Finlayson River										
		24 <sup>th</sup>	Finlayson Lake										
		29 <sup>th</sup>	Pelly River										
Aug.		11 <sup>th</sup>	Fort Selkirk										
		18 <sup>th</sup>	Leaves River										
		30 <sup>th</sup>	Mouth of Teahna lo.										
			Data obtained from their Observations										
<u>June</u>			Rain on 19 days,	Heavy rain on 4 days,		Hail on 2 days							
<u>July</u>			Rain on 14 days,	R. Thunderstorms on 3 days,									
<u>August</u>			Rain on 11 days,										
			Mean Minimum Temperature.										
<u>June</u>			37.4° F on 27 days,	July 38.8° F on 30 days,		August 40.1° on 30 day							
<u>Max.</u>			July 78.5° on 25 <sup>th</sup> ,	August 84.5° on 15 <sup>th</sup>									
<u>Min.</u>			June 28° on 5 <sup>th</sup> and 12 <sup>th</sup> ,	July 27° on 4 <sup>th</sup> ,		August 28° on 3 <sup>rd</sup> .							
			# Note - First snow September 10 <sup>th</sup>										

Table No. 2

Fort Nelson B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
<i>Mean Maximum Temperature</i>													
1937	(Station Started)										44.9	16.0	3.0
38	0.9	5.9	34.0	51.8	62.6	68.7	74.1	71.4	72.9	49.4	16.5	4.3	
<i>Mean Minimum Temperature</i>													
1937										25.5	3.2	16.4	
38	-14.2	-15.3	6.8	22.8	37.7	45.4	49.8	44.1	41.3	27.2	3.0	12.4	
Max.	30	56	54	64	84	83	85	88	91	73	36	44	} 1 or 2 yrs only
Min.	-38	-39	-14	6	28	36	38	34	26	12	32	54	
<i>Rainfall</i>													
1937										0.78	7	0.00	
38	0.00	0.00	0.00	0.02	1.20	2.95	1.70	0.86	0.30	0.68	0.00	0.00	
<i>Snowfall</i>													
1937										8.7	17.5	11.8	
38	5.3	3.7	1.5	4.3	1.0						14.8	10.1	
<i>Total Precipitation</i>													
1937										1.65	1.75	1.18	
1938	0.53	0.37	0.15	0.45	1.30	2.95	1.70	0.86	0.30	0.68	1.48	1.01	
<i>Earliest Measurable Snowfall</i>													
1937	October 9 <sup>th</sup>												
38	November 3 <sup>rd</sup>												
<i>Greatest depth snow on Ground (Estimated)</i>													
1938	38 Inches.												

Table No. 2

Hudson's Hope B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	Mean Maximum Temperature.												
1934	22.0	38.0	40.0	62.5	66.5	71.5	72.5	74.0	58.0	50.5	24.0	12.5	
35	2.3	39.3	26.3	46.1	65.3	70.8	74.9	71.2	64.0	<sup>26 days</sup> 48.2	29.7	26.3	
36	3.4	-4.9	36.1	50.1	68.7	69.1	73.8	74.2	59.3	56.2	44.9	15.3	
37	13.2	18.1	39.2	51.4	64.2	73.9	77.0	69.3	66.5	52.1	24.2	10.8	
38	19.2	13.2	42.0	54.1	<sup>27 days</sup> 67.2	71.3	78.6	72.5	74.3	55.4	31.8	22.6	
	Mean Minimum Temperature.												
1934	-2.0	16.0	16.0	29.5	35.5	40.5	47.5	45.0	34.0	29.5	8.0	6.5	
35	-21.5	12.4	-1.9	13.0	34.4	41.2	47.4	41.6	37.4	<sup>26</sup> 24.8	11.5	8.2	
36	-13.5	35.3	18.9	23.4	36.3	40.8	43.1	41.2	33.7	33.4	24.8	-6.8	
37	-13.6	10.7	15.1	25.1	32.7	39.5	40.2	41.8	36.1	31.8	6.2	-9.7	
38	-4.6	7.0	15.2	25.8	<sup>27</sup> 31.8	40.5	43.3	40.7	39.8	29.5	9.6	2.2	
Extreme Max.	55.0	63.0	65.0	86.0	90.0	87.0	92.5	88.0	90.5	82.0	59.5	57.0	
Extreme Min.	-60.0	-55.0	-15.0	-9.0	20.0	24.0	29.0	30.0	19.0	-12.2	-25.0	-47.0	
	Rainfall.												
1934	0.27	0.00	0.00	0.64	1.57	1.67	6.39	1.62	2.49	0.45	0.07	0.03	
35	0.00	0.00	0.00	0.52	1.78	1.96	2.34	2.06	1.73	0.97	0.21	0.03	
36	0.00	0.00	0.00	0.35	0.07	5.95	1.74	1.97	1.87	0.12	0.09	0.00	
37	0.00	0.00	0.10	0.47	0.62	2.79	0.74	4.35	1.87	0.93	0.00	0.00	
38	0.00	0.00	0.00	0.07	0.09	2.19	1.47	1.73	1.67	0.65	0.00	0.00	
	Snowfall.												
1934	10.8	0.2	2.0	0.7					T	10.0	19.5	5.0	
35	11.3	2.5	17.0	0.8	0.3					1.0	17.5	7.6	
36	17.8	8.8	2.5	6.8					* 41.7	0.2	2.5	8.7	
37	10.5	0.5	15.5	4.2						T	29.8	12.9	
38	2.5	6.0	8.5	2.0						4.5	12.1	4.5	
	* Note on Original record said this amount fell as snow but melted rapidly. Two days after end of storm snow practically all gone.												



Table No. 2

Hudson's Hope B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Total Precipitation</i>												
1934	1.35	0.02	0.20	0.71	1.51	1.67	6.39	1.62	2.49	1.43	2.02	0.53	
35	1.13	0.25	1.70	0.60	1.81	1.96	2.34	2.06	1.73	1.07	1.96	0.79	
36	1.78	0.88	0.25	1.03	0.07	3.93	1.74	1.97	6.04	0.14	0.34	0.87	
37	1.05	0.05	1.65	0.59	0.62	2.79	0.74	4.35	1.87	0.93	2.98	1.29	
38	0.25	0.60	0.85	0.27	0.09	2.19	1.47	1.73	1.67	1.10	1.21	0.45	
	<i>Earliest Measurable Snowfall</i>												
1934	<i>September</i>			15 <sup>th</sup>									
35	<i>October</i>			30 <sup>th</sup>									
36	<i>September</i>			11 <sup>th</sup>									
37	<i>November</i>			8 <sup>th</sup>									
38	<i>October</i>			29 <sup>th</sup>									
	<i>Maximum Depth Snow on Ground (Estimated)</i>												
1934	40		<i>Inches</i>										
35	38		"										
36	42		"										
37	28		"										
38	43		"										

Table No. 2

Ingenika Mine Ft. Graham (combined)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR		
	Rainfall														
1930	0.00	0.00	0.00	0.09	1.32	1.47	1.88	1.66	1.75	0.68	0.71	0.00			
31	0.03	0.08	0.00	0.00	0.31	2.39	0.42	1.59	0.71	1.46	0.26	0.00			
32	0.00	0.00	0.00	0.42	1.15	4.96	3.09	-	1.73	0.58	0.53	0.00			
33	0.00	0.00	0.19	0.63	1.51	1.67	1.06	1.59	0.50	1.32	0.10	0.00			
34	0.00	0.00	0.00	0.02	0.11	1.62	0.88	0.74	0.66	0.58	0.00	0.00			
	Snowfall														
1934	10.3	2.2	3.5						0.7	1.5	12.4	7.0			
35	16.3	4.3	12.7	6.3							11.5	13.7			
36	5.3	1.1	2.3						0.3		6.5	16.0			
37	9.2	4.3									7.8	21.8			
38	9.3	7.5	-								5.6	9.0			
	Total Precipitation														
1934	1.03	0.22	0.38	0.09	1.32	1.47	1.88	1.66	1.82	0.83	1.95	0.70			
35	1.70	0.53	1.27	0.65	0.31	2.39	0.42	1.59	0.71	1.46	1.41	1.37			
36	0.53	0.13	0.23	0.42	1.15	4.96	3.09	-	1.78	0.58	1.20	1.60			
37	0.75	0.45	0.19	0.63	1.51	1.67	1.06	1.59	0.50	1.32	0.88	2.18			
38	0.95	0.78	-	0.02	0.11	1.62	0.88	0.74	0.66	0.58	0.56	0.90			
	First Measurable Snowfall														
1934	September 14 <sup>th</sup>												Max depth Snow on Ground (Estimated)		
35	November 10 <sup>th</sup>														
36	Sept 8 <sup>th</sup> next Nov 3 <sup>rd</sup>														
37	November 20 <sup>th</sup>														
38	November 9 <sup>th</sup>														
														1934	30 inches
														35	28 inches
														36	24 inches
														37	27 "
														38	34 "







Table No. 2

*Mayo Landing*

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Mean Maximum Temperature</i>												
1934	-11.6	22.8	24.8	46.4	58.2	67.2	72.1	65.5	52.5	39.5	13.7	-2.5	
35	-14.6	22.2	17.5	38.5	54.5	66.1	72.1	60.6	52.9	27.6	4.4	4.0	
36	-8.4	-19.1	26.8	40.5	58.8	76.3	72.9	70.9	50.3	37.0	22.9	-10.3	
37	3.7	4.3	28.5	42.3	57.1	72.0	68.5	61.4	57.3	41.0	18.5	-5.0	
38	-1.5	-1.3	32.2	44.5	57.7	65.2	70.0	69.3	63.2	46.3	15.9	1.1	
	<i>Mean Minimum Temperature</i>												
1934	-31.9	-2.0	-7.5	21.3	33.8	40.8	46.2	43.1	25.2	24.9	-1.2	-14.8	
35	-34.1	-0.3	-13.0	19.5	31.5	40.6	45.5	38.5	29.3	11.4	-10.6	-13.8	
36	-27.5	-45.4	-4.8	15.1	34.1	48.1	48.7	44.4	31.7	21.5	4.4	-29.8	
37	-19.0	-19.2	-7.2	25.3	34.8	45.3	42.5	42.5	36.3	27.5	7.4	-21.9	
38	-21.1	-26.0	6.7	23.4	34.8	40.6	45.1	40.3	35.2	31.8	-0.2	-17.0	
<i>Extreme Max.</i>	50	53	47	66	87	91	86	82	80	64	48	45	
<i>Extreme Min.</i>	-69	-61	-46	-10	-11	30	30	22	9	-34	-45	-59	
	<i>Rainfall</i>												
1934	0.00	0.00	0.00	0.16	0.62	0.95	2.10	2.39	0.43	0.06	0.00	0.01	
35	T	T	0.00	0.00	1.25	1.71	0.88	1.88	0.43	0.71	0.00	0.00	
36	0.00	0.00	0.00	0.00	0.81	1.12	2.98	1.90	1.78	0.94	0.00	0.00	
37	0.00	0.00	0.00	0.00	1.18	1.74	1.21	2.83	1.37	0.83	0.16	T	
38	0.00	0.01	0.00	0.07	1.38	0.72	1.06	1.17	0.21	0.20	0.00	0.00	
	<i>Snowfall</i>												
1934	1.7	1.0	2.6	1.0	.				T	4.2	6.5	5.5	
35	2.5	4.1	5.1	4.0	T				6.6	18.7	9.8	12.9	
36	0.9	T	3.4	1.7					3.4	7.4	10.6	2.1	
37	8.3	1.0	0.6	T					T	2.5	1.2	1.2	
38	4.4	0.1	T	0.9						0.2	10.0	10.5	

Table No. 2

Mayo Landing

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Total Precipitation</i>												
1934	0.17	0.10	0.26	0.26	0.62	0.95	2.10	2.39	0.43	0.48	0.65	0.56	
35	0.25	0.41	0.51	0.40	1.25	1.71	0.88	1.88	1.09	2.58	0.98	1.29	
36	0.09	T.	0.34	0.17	0.81	1.12	2.98	1.90	2.12	1.68	1.06	0.21	
37	0.83	0.10	0.06	T.	1.18	1.74	1.21	2.63	1.37	1.09	0.28	0.12	
38	0.44	0.02	T.	0.16	1.38	0.72	1.06	1.17	0.21	0.22	1.00	1.05	
	<i>Earliest Measurable Snowfall</i>												
1934	October 2 <sup>nd</sup>												
35	September 21 <sup>st</sup>												
36	September 8 <sup>th</sup>												
37	October 3 <sup>rd</sup>												
38	October 30												
	<i>Maximum Snow on Ground (Estimated)</i>												
1934	12 Inches												
35	24 "												
36	30 "												
37	18 "												
38	8 "												





Table No. 2

New Hazelton B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	Mean Maximum Temperature												
1934	32.5	38.0	45.0	59.5	65.5	68.5	73.0	74.0	61.0	49.5	41.0	21.5	
35	17.7	40.8	37.5	52.3	62.8	65.1	73.5	67.8	66.1	46.5	34.0	34.4	
36	23.8	12.1	39.0	56.6	65.5	72.2	69.5	74.5	61.5	54.4	54.6	28.0	
37	11.7	25.6	46.5	50.7	59.6	70.4	70.1	63.8	62.8	52.5	35.2	23.5	
38	28.5	27.3	-	-	62.9	66.4	73.5	70.8	65.9	50.5	35.1	28.1	
	Mean Minimum Temperature												
1934	19.5	22.6	28.0	32.5	36.5	41.5	49.0	46.0	39.0	34.5	31.0	8.5	
35	2.4	25.3	20.1	24.9	34.6	42.9	47.3	43.6	37.5	29.7	21.4	27.1	
36	8.7	-13.1	22.2	27.6	39.5	46.0	46.6	46.1	40.1	36.1	28.5	15.2	
37	-6.6	6.6	28.9	31.9	36.1	42.9	46.1	44.2	39.3	37.4	24.6	14.4	
38	14.7	13.6	-	-	35.6	41.3	45.6	43.5	45.8	34.5	25.8	20.4	
Extreme Max.	52	58	55	83	90	92	91	93	83	70	51	55	
Extreme Min.	-40	-30	-3	4	22	30	30	30	20	0	-12	-35	
	Rainfall												
1934	1.56	0.10	0.34	0.66	0.58	1.54	1.68	0.86	2.53	3.48	1.54	8.00	
35	0.20	0.76	0.10	0.64	0.69	2.00	1.56	1.92	1.38	6.86	1.13	0.00	
36	0.80	0.00	0.47	0.87	1.66	2.77	3.67	1.45	1.27	1.31	3.68	0.24	
37	0.00	0.00	0.50	0.70	1.09	3.83	1.89	3.96	1.94	1.90	0.71	1.29	
38	0.09	0.00	0.00	0.00	0.16	1.42	0.47	1.20	2.76	1.43	1.22	0.81	
	Snowfall												
1934	16.5	1.0	-	-	-	-	-	-	-	T	1.5	14.0	
35	9.0	0.0	11.8	-	-	-	-	-	-	4.0	14.5	12.0	
36	12.0	6.0	9.5	0.5	-	-	-	-	-	-	2.5	11.0	
37	18.5	13.0	7.0	-	-	-	-	-	-	-	3.0	15.5	
38	7.0	4.0	-	-	-	-	-	-	-	-	3.5	8.0	





Table No. 2

Prince George B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	Mean Maximum Temperature												
1934	35.7	38.8	43.5	62.7	65.9	70.1	72.2	74.4	60.9	50.6	40.9	24.1	
35	15.8	37.6	35.4	48.2	63.9	68.7	75.8	71.2	67.0	49.2	32.7	34.9	
36	22.4	7.7	37.5	54.9	70.5	72.9	72.9	75.1	60.9	53.9	39.9	26.2	
37	9.2	26.4	48.0	52.4	63.4	72.0	75.7	67.1	68.5	54.7	34.5	26.1	
38	31.1	25.1	44.0	55.6	65.4	72.3	77.7	71.6	71.6	54.7	34.8	27.1	
	Mean Minimum Temperature												
1934	16.7	14.4	21.4	31.0	36.9	42.0	45.5	44.0	35.7	33.9	26.4	9.2	
35	-5.2	19.0	12.3	18.6	34.5	43.4	46.6	42.0	35.8	25.6	15.3	22.7	
36	-7.4	-26.6	19.5	26.0	39.1	44.5	46.8	44.7	37.6	33.1	24.5	9.3	
37	-17.6	-2.1	24.6	30.6	35.2	42.2	44.4	42.8	37.4	34.2	18.4	12.0	
38	12.7	4.5	21.0	27.6	33.6	41.8	45.0	43.0	42.6	33.2	20.2	12.7	
<i>Extreme Max.</i>	54.0	57.2	59.0	85.5	95.4	90.0	95.0	88.5	92.0	74.2	56.0	45.8	
	-54.0	-51.6	-17.5	-12.4	20.0	27.0	32.0	29.2	14.0	-3.5	-20.0	-38.6	
	Rainfall												
1934	0.54	0.23	1.20	0.26	2.91	1.87	3.92	1.16	4.99	3.19	1.56	0.10	
35	T	0.84	0.79	0.89	2.24	3.48	1.35	1.55	1.21	1.74	1.85	0.22	
36	0.53	0.18	0.66	0.83	1.47	3.64	2.81	2.56	2.26	1.66	0.83	0.02	
37	0.00	0.12	0.46	1.85	1.96	3.48	1.95	3.61	1.25	2.65	0.69	0.34	
38	0.26	0.25	0.74	0.56	1.28	1.17	1.56	2.07	2.68	1.96	1.16	1.10	
	Snowfall												
1934	10.3	4.2	6.8	T						4.5	8.7	17.0	
35	31.9	7.1	13.2	T						2.0	26.7	12.8	
36	19.1	20.8	13.5								3.9	18.7	
37	28.9	9.7	2.5	3.6							6.3	8.1	
38	8.9	14.9	4.9	T	T						8.6	24.4	

Table No. 2

Prince George, B.C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Total Precipitation</i>												
1934	1.57	0.65	1.88	0.26	2.91	1.87	3.92	1.16	4.99	3.64	2.48	1.80	
35	3.19	1.55	2.11	0.89	2.24	3.48	1.35	1.53	1.21	1.94	4.52	1.50	
36	2.44	2.26	2.01	0.83	1.47	3.64	2.81	2.56	2.26	1.66	1.22	1.89	
37	2.89	1.09	0.71	2.21	1.96	3.48	1.95	3.61	1.55	2.65	1.32	1.15	
38	1.15	1.74	1.23	0.56	1.28	1.17	1.56	2.07	2.68	1.96	2.02	3.54	
	<i>Earliest Measurable Snowfall.</i>												
1934	<i>October</i>			<i>26<sup>th</sup></i>									
35	<i>October</i>			<i>20<sup>th</sup></i>									
36	<i>November</i>			<i>2<sup>nd</sup></i>									
37	<i>November</i>			<i>6<sup>th</sup></i>									
38	<i>November</i>			<i>6<sup>th</sup></i>									
	<i>Maximum depth snow on ground (estimated)</i>												
1934	<i>35</i>		<i>Inches</i>										
35	<i>36</i>		<i>"</i>										
36	<i>48</i>		<i>"</i>										
37	<i>44</i>		<i>"</i>										
38	<i>32</i>		<i>"</i>										



Table No. 2

Lwede Creek B.C.

(Last records available)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	Rainfall												
1924	0.00	0.00	0.00	0.07	0.87	1.04	1.91	1.55	0.76	0.26	0.00	0.00	
25	0.00	0.00	0.00	0.00	0.75	0.88	0.52	1.31	2.00	0.77	0.00	0.00	
26	0.00	0.00	0.00	0.07	1.10	0.44	1.41	1.06	0.67	0.20	0.00	0.00	
27	0.00	0.00	0.00	0.23	0.58	0.27	0.80	2.82	1.08	T	0.00	0.00	
28	0.00	0.00	0.00	0.95	1.34	0.89	2.47	1.98	0.73	0.00	0.26	0.00	
	Snowfall												
1924	9.0	6.5	2.8	3.0	2.7				0.3	12.8	9.8	5.8	
25	4.8	6.8	8.8	2.7					T	0.8	7.5	9.3	
26	4.5	3.8	2.5	2.5						6.8	T	7.5	
27	4.8	1.5	3.0	5.0						6.8	0.5	17.8	
28	7.0	12.5	4.0	0.3					T	6.0	6.5	6.0	
	Mean Max.												
1924	-3.5	-2.0	24.9	30.1	57.4	67.0	67.7	65.2	49.4	28.4	12.4	-16.8	
25	-32.9	-13.3	16.4	39.6	58.9	69.5	72.0	65.5	53.5	38.0	15.2	1.6	
26	12.8	0.8	29.0	43.7	57.7	69.3	70.5	67.9	54.6	34.9	9.3	-6.7	
27	-15.9	0.3	18.7	31.1	55.5	71.4	78.2	68.5	50.0	30.7	-9.9	-16.0	
28	-4.7	4.7	9.4	36.3	54.1	70.1	72.7	64.7	51.0	27.9	18.7	1.7	
	Mean Min.												
1924	-15.0	-16.7	-0.9	5.7	37.0	43.5	46.2	41.3	31.2	15.4	-27	-27.1	
25	-46.0	-34.1	-8.3	15.8	36.1	44.5	45.6	42.4	34.9	24.7	6.4	-13.2	
26	1.4	-14.2	5.2	20.7	38.6	42.9	46.5	43.7	32.6	21.0	-0.6	-20.8	
27	-30.4	-19.7	-3.1	6.3	35.0	45.4	49.1	44.7	33.9	16.0	-20.7	-29.6	
28	-18.7	-14.7	-12.8	11.7	34.0	45.2	46.6	41.0	30.4	14.2	1.6	-13.5	
Extreme Max	27	39	49	64	81	86	91	84	78	65	47	39	
Extreme Min	-66	-60	-45	-37	11	28	31	18	12	-21	-46	-57	



Table No. 2

*Telegraph Creek (B.C.)*

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Rainfall</i>												
1924	0.00	0.16	0.13	0.39	0.05	-	-	-	1.88	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	0.44
26	0.11	0.06	0.17	0.08	0.20	0.02	-	-	-	-	-	-	1.50
27	0.00	0.00	0.00	0.00	0.00	0.10	0.16	0.04	0.11	1.05	0.00	0.00	-
28	0.11	0.02	-	0.20	0.20	-	-	0.50	-	-	-	-	-
	<i>Snowfall</i>												
1924	25.5	13.7	2.2	1.0									
25	-	-	-	-									12.5
26	11.0	10.5	1.0										3.0
27	4.0	6.0	2.5	2.2							7.5	39.0	
28	2.5	2.0	-	0.5									
	<i>Only Records Available.</i>												

Table No. 2

White Horse Yukon (Last records available)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<i>Normal Precipitation</i>												
<i>Rainfall</i>	0.00	0.00	0.00	0.01	0.34	1.30	2.32	1.53	0.74	0.36	0.12	0.00	6.74
<i>Snowfall</i>	6.1	3.3	4.7	5.9	0.1				3.1	2.9	7.7	2.4	36.2
<i>Total Precipitation</i>	0.61	0.33	0.47	0.60	0.35	1.30	2.32	1.53	1.07	0.65	0.89	0.24	10.36
	<i>Rainfall</i>												
1905	0.00	0.00	0.00	0.00	0.15	0.20	3.30	0.92	0.94	1.50	0.50	0.00	7.21
06	0.00	0.00	0.00	0.03	0.65	1.72	1.55	1.39	0.55	0.07	0.00	0.00	5.96
07	0.00	0.00	0.00	0.00	0.27	3.03	5.10	1.63	0.86	0.04	0.00	0.00	10.93
09	0.00	0.00	0.00	0.01	0.64	0.87	1.98	2.34	0.97	0.20	0.00	0.00	7.01
10	0.00	0.00	0.00	0.00	0.00	0.66	4.67	1.36	0.50	0.00	0.00	-	7.19
	<i>Snowfall</i>												
1905	17.2	0.0	1.8	1.0				T.	11.6	T.	7.0	3.0	41.6
06	5.5	7.5	0.0	2.0						2.3	11.0	2.0	30.3
07	5.5	5.2	14.5	0.8					T.	2.2	9.0	3.0	40.2
09	4.5	3.0	4.0	25.4					4.0	9.0	3.0	0.8	53.7
10	1.8	0.6	3.0	0.2	0.3					1.0	3.3	-	-
	<i>Mean Max</i>												
1905	5.3	13.4	33.9	39.7	56.8	67.3	69.6	63.0	50.5	39.9	35.1	18.8	
06	-4.8	11.1	36.1	44.6	56.3	62.3	66.3	63.0	53.0	45.4	24.5	0.0	
07	-4.1	5.5	19.3	41.8	59.0	63.7	67.3	63.5	55.0	44.7	26.5	19.0	
09	-	-	-	35.3	55.4	60.9	64.7	58.4	51.4	36.0	5.3	15.5	
10	11.6	7.6	26.2	39.4	54.8	61.9	65.6	59.6	57.4	43.0	20.0	-	

Table No. 2

White Horse Yukon

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
					<i>Mean Min.</i>								
1905	-13.3	-12.2	8.6	18.0	30.3	38.2	41.3	41.1	33.3	27.1	20.3	-2.5	
06	-26.7	-11.2	7.3	25.9	34.0	39.2	43.2	39.6	31.0	29.0	9.8	-20.3	
07	-28.5	-18.3	-10.9	14.7	32.2	37.5	43.9	40.2	32.7	27.9	8.7	4.3	
09	-40.8	-23.7	4.8	13.9	31.5	39.0	41.7	41.6	34.1	21.0	-9.1	-5.8	
10	-7.3	-19.0	6.8	20.3	31.1	36.6	43.8	37.4	34.2	25.9	5.9	-	
<i>Extreme Max.</i>	40	45	49	56	76	82	83	84	73	61	56	49	
<i>Extreme Min.</i>	-69	-58	-44	-23	13	21	28	25	16	-19	-53	-55	





AIYANSH, B. C.

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
	<u>Rain</u> (inches)												
1934	6.66	1.42	1.47	2.72	1.51	2.86	1.42	1.12	5.17	5.75	2.02	0.85	
35	0.91	1.06	1.18	0.58	2.06	2.15	0.53	2.19	3.29	9.18	5.71	2.67	
36	1.96	0.99	2.38	3.87	2.73	2.00	2.43	1.61	5.65	5.55	8.44	1.63	
37	1.03	0.22	1.91	0.63	3.91	3.41	1.72	4.06	1.16	5.13	2.08	2.64	
38	1.47	0.41	1.38	1.44	1.24	0.74	2.96	0.63	2.69	3.57	2.44	1.98	

	<u>Snow</u> (inches)												<i>First snowfall</i>
1934	111.0	9.4	19.3							4.8	39.0		Nov. 23rd
35	34.5	4.1	17.8						9.5	19.6	17.5		Oct. 25th
36	25.7	5.78	7.5						4.0	7.35			Nov. 7th
37	31.7	5.10	1.5						12.0	4.76			Nov. 2nd
38	34.3	10.0	0.5						5.7	3.76			Nov. 7th

	<u>Total Precipitation</u> (inches)												
1934	17.76	2.36	3.40	2.72	1.51	2.86	1.42	1.12	5.17	5.75	2.50	4.75	
35	4.36	1.47	2.76	0.58	2.06	2.15	0.53	2.19	3.29	10.13	7.67	4.42	
36	4.53	6.77	3.13	3.87	2.73	2.10	2.43	1.61	5.65	5.55	8.84	1.98	
37	4.20	5.32	2.06	0.63	3.91	3.41	1.72	4.06	1.16	5.13	3.28	1.40	
38	4.40	1.40	1.43	1.44	1.24	0.74	2.96	0.63	2.69	3.57	3.01	2.74	

	<u>Maximum length of snow on the ground at any one time</u> (inches)												
1934	6 1/2	2	17							4	12		
35	12	2	1						9	19	11		
36	11	17	2						4	34			
37	1	1	1 1/2						10	17			
38	21	9 1/2	T						5 1/2	15			





REPORT TO THE PUBLIC WORKS DEPARTMENT OF BRITISH COLUMBIA  
ON RECONNAISSANCE SURVEY OF NORTHERN PART OF ROUTE "B" -  
BRITISH COLUMBIA - YUKON - ALASKA HIGHWAY BETWEEN LIARD  
RIVER AND SIFTON PASS.

By E.Lamarque

General Statement

This report contains an account of a reconnaissance carried out during the summer of 1939 in the region lying between the British Columbia - Yukon boundary, where the Liard river crosses it a few miles above the confluence of the Dease, and Sifton Pass, somewhat less than two hundred miles to the south-east. The expedition was undertaken to determine the suitability or otherwise of this little known region as a route for a motor highway.

In order to carry out this work, I left Vancouver on the evening of the 31st of June with three assistants, E.Cushing, K.Ford and C.King. Travelling by the Canadian Pacific Railway Company's steamship Princess Louise, we reached Wrangell, Alaska, at 2 a.m. on the 6th, and left there on the afternoon of the same day by the motor vessel Hazel B of the Barrington Transport Company for Telegraph Creek, 140 miles up the Stikine river. We reached Telegraph Creek on the evening of the 8th and, after outfitting there, left on the 11th with two Indian packers, Loudecker and Harry Karlick, and 14 horses, for Dease Lake where we arrived on the 15th. On the 17th after obtaining information about various routes, E.Cushing and K.Ford with two packers and 14 horses - ten pack and four saddle - left for the Lower Post, half a mile above the confluence of the Dease river with the Liard, via the upper Turnagain river, Mosquitoe and Sand creeks, with instructions to form a cache of supplies at the confluence of the Turnagain with the Kachika and are proceeding, as lightly loaded as possible, to their destination.

In the meantime, C.King and myself, after an unavoidable delay of some days at Dease lake, left by one of Hope and Marion's scows for the Lower Post

in the morning of the 22nd, via Dease lake and river. We stopped for the night at McDames and reached the Lower Post the next evening, where we were busy in the general locality till the 7th of July, when E.Cushing and K.Ford with the packers and horses arrived from the south-east. On the 9th, after replenishing our supplies for the remainder of the season, we commenced our reconnaissance towards Sifton Pass which we reached on the 5th of September, and the Finlay river at Fort Ware on the 8th. On the 9th, K.Ford and C.King left for Prince George by boat via the Finlay and Parsnip rivers. They reached their destination on the 16th and Vancouver on the 20th.

On the 10th E.Cushing, the two Indian packers and fourteen horses left for Telegraph Creek via Two Brothers Lake and Hylands Post. Delayed by stormy, inclement weather, and having to abandon one horse en route, they reached Telegraph Creek on the 2nd of October, where the Indians were paid off and the outfit, other than that brought out by Mr Cushing or Mr Ford, stored with the Government Agent there. Delayed by lack of transportation on the Stikine, Mr Cushing did not leave Telegraph Creek till the 9th. He arrived at Vancouver on the 14th.

On the 10th of September, I left Fort Ware by mail plane for Prince George, arriving there in two and a half hours flying time. Leaving there on the 12th, I reached Vancouver, via Quesnel and Squamish, on the 13th. The plane journey from Fort Ware enabled me to appreciate the value of low flying for reconnaissance purposes to an observer accustomed to making rapid notes.

#### Acknowledgments

The successful completion of this reconnaissance is principally due to the hearty cooperation of all the members of the party and especially to the energy and ability shown by E.Cushing and K.Ford. We received considerable assistance, also, from officers of the Hudson's Bay Company and residents of the district at Dease Lake, McDames and the Lower Post, and are particularly indebted to D.B.Carter of the Forestry Branch and the British Columbia Police, who not only took our radio messages but transmitted them to their destination.

Methods of Survey

A rapid chain-compass traverse was made of our route from the confluence of the Dease river with the Liard to that of the Gataga with the Kachika, about 130 miles, where we tied into signals established by H. Pattinson of the Department of Lands who was triangulating north of Sifton Pass. From the Gataga to Sifton Pass, our distances were estimated on a time basis and controlled by Mr Pattinson's survey. At the Lower Post, we tied on to the base line established by Mr Moncton prior to the commencement of his triangulation southward; our distances from the Post northward to the provincial boundary being estimated by time.

Excursions on either side of our route were made where necessary and several hills and mountain slopes ascended for the purpose of general reconnaissance. Observations for latitude were taken at several points between the Dease and Gataga rivers and, in order to determine the magnetic variation, occasionally for azimuth. On the chained traverse blazed trees mark the miles.

The party was well equipped in every way, and the radio, which weighed with batteries complete, in a strong case suitable for a side-pack on a horse, only seventy pounds, was of great value. A recent model, built for the Forestry Department of the Province, it proved remarkably efficient, and from the middle of July we were in frequent communication with Colonel Rolston's party on the southerly end of route "B", initially contacting them when quite three hundred air miles distant and, latterly, the Forestry Station at Prince George when over four hundred air miles therefrom.

Except on the Liard and Dease rivers in the vicinity of the Lower Post, the party depended on pack animals for transport within the area of reconnaissance. These were available in the numbers and with the required equipment either at Telegraph Creek or points so far to the south that their safe return there in the fall would have been problematical. They were hired, therefore, as already noted, at Telegraph Creek.



H i s t o r y

The country was first explored by the fur-traders of the Hudson's Bay Company who entered it from the north-east by way of the Liard. Mr J. McLeod ascended the Liard and the Dease rivers in 1834 and Robert Campbell wintered at Dease lake in 1838-39, and in the forties the Liard was used by the Company to supply their posts on Frances Lake, on the Pelly, and at the confluence of the Pelly with the Lewes. In 1849 Fort Pelly Banks at the northerly end of the portage from Finlayson lake, was burned and abandoned; in 1851 Fort Frances was also abandoned, and in 1852, Fort Selkirk at the mouth of the Pelly, was raided by coast Indians, and though Robert Campbell made every effort to have the post reestablished, it too was abandoned. After this, the upper Liard was probably entirely deserted by white men till, in 1872, two prospectors, Henry Thibert, a French-Canadian, and McCulloch, a Scotchman, found their laborious way to Dease lake from the Red river (Manitoba), via the Athabasca, Mackenzie and Liard rivers. With no John Company to back them, the courage and hardihood of these two adventurers can only be contemplated with admiration. Their persevering efforts were rightly crowned with success for the next year, in '73, they discovered gold on Thibert creek, a stream that enters Dease lake from the west near its lower end, and thus mining in this part of the Cassiar was started and carried on, more or less successfully, to the present. In '74 the placers of McDames creek were found and it is said that a million dollars was taken from the district that year, and that the total value recovered to 1887 was about five millions.

P o p u l a t i o n

The population of the district, even to-day, is very limited. The Indians living within or in the country contiguous to our line of reconnaissance would hardly exceed twenty-five families, possibly a hundred all told. They belong to the Athapascan linguistic group and are of the Tahltan, Sickanni or Beaver tribes. They usually trade at the Lower Post, McDames or at Fort Ware, occasionally going as far as Fort Nelson, on the Fort Nelson river to the east,

and south to Dease lake and even to Telegraph Creek. In 1935 the Hudson's Bay Company reestablished a post at Frances lake, abandoned for eighty-four years, bringing in their supplies from Whitehorse by air, but it is doubtful if any Indians from British Columbia trade there.

Besides the natives, there are a few white trappers. Nearly a dozen of these make their headquarters during the summer at the Lower Post and most of them trap in Yukon Territory. Two, Messrs Fosberg and Ludwig Smaaslet, fly to their headquarters cabin on Rabbit lake, a lake expansion of Rabbit river, some miles to the east of the Kachika. The white trappers who make Fort Fare their headquarters during the summer, trap to the west and south of that post, and, with one or two exceptions, do not enter the area under discussion. Except for surveyors of the Department of Lands working to the north of Sifton Pass, and for two Indians who caught up to us with mail when we were south of the Turnagain, we did not see a soul between the Lower Post and the Pass, or excepting old camping sites of the natives, any sign of human habitation between the Dease and the Turnagain. At the confluence of the latter stream, however, with the Kachika, there are about half a dozen old cabins, relics of the days when R. Sylvester had a trading post there, established about sixty years ago and afterwards taken over by the Hudson's Bay Company. This post was supplied by pack-trail from McDames, a trail that is reported to be well located and easy to follow. It is, in fact, part of the main trail from Fort Nelson and is used by hunting parties and others who may enter this northern wilderness from the east. Colonel Moodie, in charge of a detachment of the North West Mounted Police, came north through Sifton Pass in 1898 down the valley of the Kachika, and, entering this trail at the westerly limit of the valley about five miles from Chee House, as this old-time establishment of Sylvester's is called, followed it to McDames. The Colonel wrote a remarkably good report of his northland journey and his notes and plan of this area proved valuable to us. South of the Turnagain there are half a dozen or more cabins in the valley, the majority within a few miles of the Pass. They were all unoccupied when we passed by.

C l i m a t e

The climate in the region of our reconnaissance appears to be one of generally low precipitation and varying winds. It is reported that strong winds are frequent along the Kachika in winter and that the depth of snow in the lower valley rarely equals, and seldom exceeds, eighteen inches. Above the Gataga the snowfall is greater and the snow is probably quite four feet deep at Sifton Pass toward the end of the winter. For many miles north of the Turnagain, as far or slightly to the north of Red river, the snowfall is probably about the same as that along the Kachika below the Gataga. The small sage, Artemisis Frigida, is abundant on many of the open hillsides and signs of wind erosion, usually associated with dry or semi-arid regions, are not lacking. North of the Red river, the precipitation evidently increases, and a depth of about three feet of snow is reported at the Lower Post, and for thirty miles or more to the south-east. The summer of 1939 was, we were informed, wetter than usual. There were thirteen showery days in July when we were between the Lower Post and the Turnagain, and fourteen in August, in the valley between the Turnagain and Sifton Pass. Never during these two months, unless at some time during the night, was the sky completely clear.

At midnight, on the 14th of July, at an elevation of about 3,000 feet, the temperature fell to 27 F., and at dawn on the 18th of August, at an elevation of about 2,500 feet, the temperature was 24. The highest recorded in July was 82, at noon on the 17th; the highest in August, 85 at noon on the 9th. Temperatures of between 50 and 60 below zero F. have been recorded in the winter time at the Lower Post. Winter prevails from the beginning of November to the end of March. As elsewhere, the seasons vary, but it is probable that there is but little snow left in the lower valleys by the end of April, and that it rarely falls to stay before mid-October. Dease lake is usually free of ice during the last week in May or the first, in June, and the Dease, Liard and Kachika rivers early in May.

F a u n a

The principal mammals found in this region are members of the bear and deer families. We saw only two or three black bears during the summer and no



grizzlies. The latter are probably fairly numerous in the mountains where one of their principal foods is the hoary marmot or whistler. Neither moose or deer are plentiful, owing, it is said, to the numerous wolves, which are reported to hunt in packs of a dozen or more individuals during the winter and to be a menace to the horses of the natives or others wintering in the region of the Kachika.

A species of woodland caribou has a wide range throughout this part of the Province. These animals are frequently found in small herds on the broader, plateau-like hills between the forested lowlands and the higher mountains. Mountain sheep (Ovis Stonei) and mountain goats are generally well distributed in the mountains on either side of the valley of the Kachika, though only a few were seen by the party during the summer. Most of the common fur-bearing animals are trapped in the district, but it is doubtful if they are abundant. They include lynx, marten, mink, fisher, foxes, wolverine, wolves, musquash and beavers. Signs of the last-named were quite numerous. Trout are fairly abundant in the streams and lakes.

#### F l o r a

The forest - nowhere of importance for export - consists of spruce, tamarack, pine, poplar, cottonwood, many varieties of willows and some birch. Down in the bottoms, on heavier soils, cottonwood of between thirty and forty inches in diameter are found. Spruce sometimes reach a diameter of two feet; pine rarely more than a foot or eighteen inches. At higher elevations, balsam firs are abundant, extending to timber-line, here at an altitude of about 5,000 feet. Tamaracks a foot in diameter are rare; eight to ten inches is their average size. In the vicinity of the Red river, it appears to take about sixty years for poplars to attain a diameter of six inches; cotton, seven inches; pine, nine inches; and spruce, eight inches. Their height then would average fifty feet. Prof. Davidson of the University of British Columbia, has kindly given the names of some of the species of plant life found along our route between the Lower Post and Sifton Pass. The list will be found at the end of this report.

Potatoes and other vegetables of the hardier variety are grown at the Lower Post and at Fort Ware, and no doubt could be grown in the valley of the Kachika below the Gataga. The agricultural possibilities, however, are so exceedingly limited as to be practically negligible. Horses can easily winter out on the lower Kachika and to the east of the Dease river, in the valley some distance above the confluence of the Blue, where the snowfall is light.

#### T r a n s p o r t a t i o n

The upper Liard river in British Columbia is usually reached by way of the Stikine river to Telegraph Creek, the motor road from there to Dease lake and by the Dease river. The Barrington Transport Company operate boats on the Stikine river, usually about three times a month from the middle of May to the middle of October. The motor road between Telegraph Creek and Dease lake, 72 miles long, is, for a frontier region, reasonably good, and the journey, either by truck or car, takes from six to eight hours. The voyage from Dease lake to the Liard, usually takes two days; the return journey, up-stream, three or four.

Air transportation is now frequently used both for passengers and freight. There is a small air field on the plateau above the Stikine at Telegraph Creek and in the winter time the mail is brought there by air from Atlin, two hundred miles to the north. Dease lake affords an excellent landing for planes, and the Dease river at McDames, and the Liard at the Lower Post are frequently used though the main landing for the Liard is at Watson lake, about twenty-five miles to the north-west of the Lower Post. This lake, situated about three miles north of the Liard river and reached by pack-trail from the Lower Post, is used by the Yukon-Southern Company's planes on their passenger and mail route between Edmonton and Whitehorse. They have a radio station there. Between the Lower Post and Sifton Pass planes can land at Fishing Lake, fifty miles from the Post; at Birch Lake, ten miles further to the south-east, and on a lake about eighty miles from the Post, and a hundred north of Fox lake, a good landing some forty miles from Fort Ware on the Finlay river, and about ten miles south of Sifton Pass. The Kachika, below the Gataga, might also be used

in case of emergency. The Finlay river at Fort Ware is the regular landing place for the plane carrying the mail twice a month to this place during the summer time, somewhat more than two hours' flight from Prince George on the Canadian National Railway.

Practically all freight and passengers for Fort Ware, the most northerly trading post on the Finlay river, are brought in by open boats from Summit lake via the Crooked, Parsnip and Finlay rivers; the only real obstacles to navigation being the shallows on the Crooked river and the rapids of Deserters Cañon on the Finlay about one hundred miles below Fort Ware. At low or medium stage of water, this cañon is easily navigated by the motored boats used on the river to-day. At very high water, however, freight may have to be taken across the half-mile portage, or transport delayed till the water drops. A motor road, thirty miles long, connects Prince George with Summit Lake.

The Liard river is used by trappers and prospectors between the Lower Post and the confluence of the Kachika, at medium or low stages of water. Navigation of this river, however, is in this section obstructed by the rapids of the Little Cañon, some thirty-five miles below the Lower Post, by whirlpools some four miles below this cañon, and by the Cranberry rapids where a mile and a half of rough water is reported some distance above the confluence of the Kachika. The Kachika itself is said to be free of rapids from where it enters its main valley, about five miles north of Sifton Pass and the Liard river. Boats have been built near the pass and the river successfully navigated, at a good stage of water, from there to the Liard. Above the Gataga river, which comes in from the east about sixty miles north of the Pass, it is full of driftwood and is locally called Driftpile river. This drift makes navigation somewhat hazardous, and fallen trees or sweepers, which may extend completely across the stream in its narrower parts, add to the difficulties. The Liard and Kachika rivers, therefore, afford doubtful means of transport to the central and upper part of the area between the Lower Post and Sifton Pass. It is one, nevertheless, that should be more fully investigated.

Little is known about possible navigation on the Turnagain which enters the Kachika about a hundred miles above the Liard. A tractor road has been



built from the southerly end of Dease lake to the headwaters of this stream where there are many lake expansions. Below these expansions, some of them suitable for plane landings, the stream falls about 1,200 feet on its way through the Cassiar range to the Kachika, a distance of about one hundred miles. It is reported to be frequently canyoned, and it may be expected that navigation would be difficult.

Besides waterways and airways, there are various pack trails in the region. These trails are at present only suited for pack animals but they are usually well located and might, in some instances, be fairly rapidly and economically transformed into rough roads over which tractors could pass. Of these, the Davey Trail, which extends from the Lower Post to the Kachika river some five miles below the junction of the Turnagain is, as the plan shows, remarkably straight and a credit to its locator, Davey, who died at Fort Ware early in September at the great age of ninety or over. It is said that he was born in the Province of Quebec, and that he had lived in this part of the north for over seventy years. In winter dog teams are usually used for all transport. Very little freighting is done but planes can be and have been used and tractors were used last winter to haul machinery and heavy material to the mining camp at Boulder Creek on the Turnagain over the tractor road from Dease lake noted above.

#### General Description of the Country

This part of northern British Columbia is more or less of a mountainous character, the chief ranges being those of the Cassiar and Rocky Mountains where some of the higher peaks may attain an elevation of 9000 feet. The central portions of the Cassiar range contain belts of intrusive rocks, but their eastern flanks, probably consist almost entirely of sedimentary formations of argillites, quartzites, and particularly limestones, abundant. The Turnagain and many of the small streams south of it coming from this range contain a great deal of lime, and small sloughs and ponds often have beds of calcareous mud two or more feet in depth above limestone boulders and

rubble. It seems probable, also, that similar formations are mainly present in the Rocky Mountains in this region and intrusive rocks almost, if not entirely, absent.

In the vicinity of the Liard and the lower Dease and Kachika rivers, the higher mountains are distant, and the country has the appearance of an undulating, densely wooded plateau, broken here and there by low, forested ranges or isolated hills. It is essentially a wilderness of which little is known and where people are few.

The drainage is to the western Arctic by way of the Liard and Mackenzie rivers. The Liard is a big river with its headwaters in the mountains in Yukon Territory. It averages seven or eight hundred feet in width from the Yukon boundary to the Dease, almost immediately below which it expands, is often half a mile or more wide, and generally full of islands to where it makes a big bend to the north about twenty miles below the Dease. At this bend it is apparently deflected by a low plateau of massive clay formation which rises precipitously for from two to three hundred feet above the water. The river here turns almost a right angle and a fair-sized stream, known as Twenty Mile creek, enters from the south through a wide gap in this low plateau. Hyland river, a large stream about the same size as the Dease, enters from the north about seven miles above the bend. At medium stage, the Liard may carry about twenty-five thousand feet a second above the Dease, and its current is about five miles an hour.

The Dease river has a northerly course from Dease Lake and for several miles is quite narrow and very crooked, many of the bends being remarkably sharp. The river, from many small tributaries, soon becomes larger, but the numerous bars, driftpiles and shoals are troublesome to the navigator. Further down are several rapids, all of which require care in navigating though none are particularly dangerous.

About ten miles below McDames Post, a trading centre on the left bank of the stream, and fifty or more below the lake, the river, which has so far followed a north-easterly course, turns abruptly to slightly west of north,

a direction it pursues for some thirty miles till, just to the east of the Cassiar range, it resumes its former course to reach the Liard thereby some thirty miles below. The stream, at an average stage of water, may carry from ten to fifteen thousand cubic feet a second.

The Kachika or Big Muddy river heads in the mountains far to the south of its confluence with the Liard. It is a big, dirty river with an average flow of perhaps twenty thousand feet a second. Its main tributaries are the Turnagain and Frog from the west, the Gataga from the east. The Gataga is a big, muddy stream and probably the principal cause of the sediment in the Kachika. The Turnagain heads in a high plateau country about fifty miles east of the southerly end of Dease lake, and flowing for a hundred miles or more north-easterly through the Cassiar range, joins the Kachika about a hundred miles above the Liard.

The Frog is much smaller, and rises in the high mountains of the continental divide far to the south-west of its confluence with the Kachika.

#### Description of the Route

The country in the general vicinity of the Lower Post is of an undulating, densely forested nature of somewhat low relief, the hills for many miles on either side of the Liard, not exceeding a few hundred feet above the river which, at the confluence of the Dease, is about 2000 feet or more above sea level.

From a high ridge to the south of the river, about a mile and a half from the Post, the Cassiar range is visible far to the south, and lower, isolated peaks and ranges far to the east and north. From another and higher ridge, some eight hundred feet above and just to the north of the river, very close to the boundary between British Columbia and the Yukon, high hills and low mountain ranges are visible to the west and north-west, where the country presents a similar, though somewhat rougher appearance, to that to the south-east. It was noticeable, moreover, when descending the Dease river, that the country for many miles above its confluence with



the Liard has, in general, the same characteristics as those already described and that the terrain through which the Blue river, some twenty-five miles above the Liard finds its way to the Dease from the north-west, appears to be low and probably favourable for economical highway construction.

Throughout this wooded, undulating country there are many small ponds, lakes, swamps and streams. The swamps on either side of the Davey Trail which, as already mentioned, pursues a remarkably straight course from the Lower Post to near the confluence of the Turnagain river with the Kachika, are rarely of any great extent and so situated in relation to gravel ridges and benches that they could be either entirely avoided or narrowly crossed by a highway located in the general vicinity of this trail. The swamps through which the trail passes usually have a firm bottom of gravel or small boulders about a foot below the surface and in only one instance did their crossing present any difficulty to our pack animals.

About thirty miles south-east of the Dease river, from a low ridge over which the trail passes, both the Cassiar and Rocky Mountain ranges are visible, ranges that become more evident as the traveller proceeds to the south-east till, near the Turnagain, the intervening valley may be said to form the northerly end of that celebrated physiographical feature, known as the Rocky Mountain trench, one that persists from this locality for nearly a thousand miles to the south-east, to within United States territory in Montana.

For many miles south-east of the Lower Post, as far as the Red river, 47 miles distant, the drainage is to the north-east and throughout this section the general character of the terrain hardly varies. It is more hilly to the west than to the east of the Davey Trail, and it is quite evident that a highway would be in the general vicinity of this trail which forms, therefore, an admirable base for a preliminary survey, which our rough traverse thereof should considerably facilitate.

About twenty miles from the Lower Post, the trail follows for over two miles what appears to be an old river channel which, where observed, has an

average width of about 1000 feet, and a general elevation of some 600 or 700 feet above the Liard river at the Lower Post. This old channel, where the trail follows it, has a direction somewhat south of east but turns to the north-east where the trail leaves it and it is probable that the small, five foot stream which meanders through it drains into Twenty Mile Creek, a stream that enters the Liard where that river turns abruptly to the north some twenty miles below the Lower Post.

It seems probable, also, that all the small creeks the trail crosses in this part of the plateau drain to Twenty Mile Creek, and as their distance thereto can hardly exceed ten or fifteen miles and they are here several hundred feet above the Liard, their fall, north of the trail, must be quite precipitous, indicating a very broken, gulch-ridden terrain in that direction. Twenty Mile creek itself, about forty feet wide at its mouth, enters the Liard through a deep gulch whose width is out of proportion to the size of the stream and it is just possible that the old channel, to which I have referred, may bear some relation to this condition.

It seems probable, also, that should the Blue river route be adopted, the location thereto would leave the Davey Trail in its vicinity.

If a definite limit can be set for the northerly end of the Rocky Mountain trench, a point where the valley ceases to be well defined, it might be placed where the Davey Trail crosses the Red river, about twenty miles north of the Turnagain, where the Red river itself turns somewhat abruptly to the north-east along the northerly limit of a high, wooded ridge which, up to that point, may be said to form the easterly side of the valley north the Kachika. At or near the Red river, too, the towering bulk of the Cassiar range swings to the west just as, twenty miles south of the Turnagain, the Rocky Mountains turn eastward.

The Red river itself is the only stream between the Dease and the Turnagain that could be called a river. It rises far to the west, in the ranges not far from the Dease river and pursues a very sinuous course in a wide valley, is swift and has above the trail an average width of about 100

feet. Near the trail it spreads out through many channels in a flood plain and it is reported to enter the Kachika about twenty-five miles below the Turnagain.

South of the Red river, the trail follows the easterly side of the valley, that is here about five miles wide, and the character of the terrain all the way to the Turnagain is very similar to that north of the river. In this section the valley contains two, low, wooded central ridges. The more northerly commences at the Red and parallels the valley for five or six miles, Fishing lake lying between it and the easterly side. This lake, over three miles long, half a mile wide and containing many small islands near its southerly end, appears to drain to the Red river, from which it is about three miles distant, by a small winding stream that perhaps reaches the river subterraneously for the confluence was not seen.

The trail hugs the easterly side of this lake for about two miles to follow across undulating side hills on this side of the valley and reach the Kachika, sixty-six miles from the Lower Post, with Davey creek which flows to the river through a narrow, precipitous defile at the north-easterly termination of the southerly of the two ridges noted above. This ridge is in the form of an ellipse with its long axis a diagonal to the valley; its southerly slopes fall to the Turnagain, its easterly to the Kachika. Its maximum elevation above the valley is about 400 feet, and on its westerly side, between it and the Cassiar range, is a string of lakes, the largest and most northerly of which we have called Birch lake. The lakes, which are remarkable for their rainbow colouring and beautiful situation, evidently drain into a tributary of Davey Creek.

From the Red river to the Kachika, the location of the highway would, in all probability, be very close to the pack-trail, swinging easily down on light grades round the north-easterly side of the southerly ridge to the low jackpine benches along the Kachika, which it would follow to the Turnagain.

The Turnagain, which is a large stream of the same order as the Dease, can be conveniently and economically crossed about two hundred yards above



its confluence with the Kachika. It is there about 250 feet wide. The Kachika is a much larger stream and between the Turnagain and the Davey Trail, five miles below, it is from 500 to 700 feet in width.

The Davey Trail ends at the Kachika, and the natives cross the river there to the well-used trail on its easterly side which extends to Sifton Pass and the Finlay river at Fort Ware, the trails on the westerly side of the river being but little used and more or less obliterated by windfalls and forest debris.

On account of the formidable crossing of the Kachika, however, we examined the westerly side of the valley to above the confluence of the Frog with the Kachika, for about six miles from the Turnagain and found the terrain on the whole more favourable than that to the north, and, in general, very similar.

About twenty miles south of the Turnagain, the Rocky Mountains sweep westward to within three miles of the Cassiar range, which is the general width of the intervening valley to above the Frog where it becomes much narrower, averaging hardly more than half a mile in width and sometimes not much more than a quarter its approximate size at Sifton Pass.

The scenery along this section of the route is bold and beautiful and should be a great source of attraction to motorists. Moreover the topography of the valley is such as to allow long tangents, easy grades and easy curves, conditions unusual when travelling through mountains and the more, therefore, enjoyable.

The route we blazed through this section of the valley is never far from the probable location of a highway and usually in its approximate position. On the whole the country is more open than that to the north and the clearing would be lighter.

Only two large streams enter the Kachika from the west between the Turnagain and the Frog. The first, which we called Moody Creek, is about twenty miles south of the Turnagain. It would be crossed just above where it commences to spread out in the lower part of the valley.

The second stream enters the valley about twelve miles below the Frog and its crossing is a more difficult matter than the first. After passing through the range, it is deflected sharply to the north by a rocky ridge parallel to the valley from which it frees itself by another sharp turn to the east to run, in seasons of flood, riotously across the valley to the Kachika. The estimated cost of this crossing is \$25,000.00, and by careful location it should be sufficient.

It seems probable that it will be more economical to cross the Frog and Kachika rivers separately than the combined stream below the former, as the Kachika is there broken into many channels and no suitable bridge site was observed. Before this is decided, however, a careful survey will have to be made of this area and, if not suitable, it is probable that the Kachika (here called the Driftpile) can be economically bridged at a low rock canyon about three miles above the Frog. The location of this crossing, also, will depend on a further examination of both sides of the Kachika to a point about fifteen miles above the Frog, above which point the easterly side of the river is undoubtedly the better for on the west the country is often rocky and the topography considerably rougher.

The westerly side was examined for about twenty-five miles and a reasonably good location could be obtained for about fifteen, though a wide and rather deep ravine, showing evidence of ice pressure in winter - a succession of frozen overflows from its creek - might be expensive to negotiate. Apart from this and one big creek crossing, the terrain is generally favourable.

The distance between the Gataga and Frog, where they enter the Kachika, is about four miles, and the valley of the Gataga - diagonally across it where it joins the Trench - is fully seven. The Gataga itself hugs the northerly side of its valley, and the Kachika, here of a very winding character, is deflected to the west about three miles above the Frog, near the upper limit of the Gataga valley. The terrain on the easterly side of the Kachika, within the valley of the Gataga, consists of a series of gravel benches which

present little difficulty to highway construction.

Immediately above this valley on this, the east side of the river, the Trench narrows and the ground becomes broken and comparatively difficult, with many low ridges between which the drainage is frequently poor and there is some swamp and occasionally ponds or small lakes. The pack trail is here three or four hundred feet above the river, to which the ground falls in a series of benches.

Above, where the location will definitely be on this side of the river, the terrain is generally quite good. Three large creeks enter the valley on this side. They will have to be crossed where they leave the hillsides to debouch across the valley floor in wide, shallow, gravel-strewn beds.

The Knochika will be crossed again where it enters the Trench from the Rocky Mountains. From this crossing to and beyond Sifton Pass, five miles distant, the location will be about in the centre of the valley where, with the exception of half a mile or so of heavy sidehill work, construction should not be expensive.

As this report is accompanied by statements relating to bridges, culverts and probable quantities for approximately every mile from the Dease river to the Pass, it is not here necessary to discuss these details. It may be added, however, that gravel appears to be abundant along the entire route from the 60th parallel to Sifton Pass, and that the haul of this material for surfacing purposes will probably never exceed half a mile. Gravelly soils, indeed, predominate; the heavier clay soils, except in the lower areas, along creeks or river bottoms, are less in evidence. Barely a hundred stations of rockwork may be expected.

#### Summary and Conclusion

The reconnaissance shows that a good, generally economical route for a motor highway exists from the crossing of the Liard river at the lower cañon on the northerly boundary of British Columbia to Sifton Pass along, or very close to our line of traverse, a distance of very approximately 180 miles.



Two possible bridge sites were measured on the Liard, and two on the Dease. It is evidently more economical to cross the Dease and the Liard than to cross the Liard below the Dease where the length of span required would considerably exceed the combined crossings.

In order to avoid crossing the Kachika river below the Turnagain - a major crossing of about 600 feet - the location should hold to the west of the stream, anyway to above the confluence of the Gataga. The country on the easterly side of the Kachika is probably as favourable, or even more so, than on the west, but it would hardly make up for the extra cost necessitated by bridging it below the Turnagain, and the crossing of the Gataga - at least 175 feet - would about balance the crossing of the Frog and the Kachika above it.

It is more sunny on the easterly side of the valley, but as the location on the west side of the river will be more in mid-valley than close to the slopes of the Cassiar range, the difference in this respect should not be great. In any case, this section will get more sunshine and less snow than that above, towards Sifton Pass, where the valley is narrower and the snowfall greater.

Regarding the Liard river, it must be pointed out that it may not be advisable to cross this at the Lower Cañon at the 60th parallel; it may prove economical to keep on the southerly side of the stream far into Yukon Territory, but as the southerly boundary of that Territory was the northerly limit of our reconnaissance, we have no observed data on this question.

There is the question also of the Blue river route, which, as already noted, could conveniently leave the line of our traverse about twenty miles south of the Dease river and - assuming favourable terrain - reach the valley of the Liard about twenty-five miles above the Frances, to follow northerly along its valley and those of North river and Big Campbell creek to the confluence of the latter with the Pelly. Such a route might save twenty miles in distance over any other to this point, and perhaps bridging costs would be less.

In conclusion, then, there is little ambiguity regarding the location of a highway from Sifton Pass to a point some twenty miles from the Dease river, but from there north the location depends on the Blue river terrain within the Province of British Columbia and on that adjacent to it and the Liard in Yukon Territory.

ALASKA HIGHWAY

Liard River (Yukon Boundary) to Sifton Pass

(1)	<u>Liard River</u>	250' steel deck span - concrete abutments on solid rock -		
		Span	\$ 97,000.00	
		Abutments	<u>12,000.00</u>	\$109,000.00
(2)	<u>Dease River</u>	3, 110' H.T.spans on pile piers and 6 spans of trestle approaches -		
		3 spans at \$9,000.00 each	27,000.00	
		102' trestles at \$30.00	4,400.00	
		2 pile piers at \$2,200.00	4,400.00	
		2 " " " 1,400.00	<u>2,800.00</u>	
			<u>38,600.00</u>	38,600.00
(3)	<u>Red River</u>	1, 110' H.T.span at \$9,000.00	9,000.00	
		38' trestle at \$30.00	1,140.00	
		1 concrete abutment	3,000.00	
		1 pile pier	<u>1,200.00</u>	
			<u>14,340.00</u>	14,400.00
(4)	<u>Davey Creek</u>	1, 50' King span	2,200.00	
		38' trestles at \$30.00	1,140.00	
		2 pile piers at \$800.00	<u>1,600.00</u>	
			<u>4,940.00</u>	5,000.00
(5)	<u>Turnagain River</u>	2, 120' H.T.spans at \$11,000.00	22,000.00	
		51' trestle at \$30.00	1,530.00	
		1 concrete abutment	4,000.00	
		1 pile pier	1,800.00	
		1 " "	<u>1,600.00</u>	
			<u>30,930.00</u>	31,000.00
(6)	<u>Moody Creek</u>	1, 110' H.T.span	9,000.00	
		170' trestles at \$30.00	5,100.00	
		2 pile piers at \$1,200.00	<u>2,400.00</u>	
			<u>16,500.00</u>	16,500.00

(7)	<u>Denatiah Creek</u>	1 120' H.T. span	\$ 11,000.00	
		442' trestle at \$30.00	13,360.00	
		2 pile piers at \$1,200.00	2,400.00	
			<u>26,760.00</u>	\$27,000.00
(8)	<u>Hayes Creek</u>	1 60' King span	2,500.00	
		63' Trestle at \$30.00	2,040.00	
		2 pile piers, \$800.00	1,600.00	
			<u>6,140.00</u>	6,200.00
(9)	<u>Frog River</u>	1, 125' H.T. span	11,000.00	
		63' trestle at \$30.00	2,040.00	
		2 pile piers at \$1,600.00	3,200.00	
			<u>16,240.00</u>	16,300.00
(10)	<u>Kachika River</u>	1, 120' H.T. span	11,000.00	
		2 concrete abutments	6,000.00	
			<u>17,000.00</u>	17,000.00
(11)	<u>Two O'Clock Creek</u>	1, 60' King span	2,500.00	
		63' trestle at \$30.00	2,040.00	
		2 pile piers at \$800.00	1,600.00	
			<u>6,140.00</u>	6,200.00
(12)	<u>Canary Creek</u>	1, 60' King span	2,500.00	
		68' trestle at \$30.00	2,040.00	
		2 pile piers at \$800.00	1,600.00	
			<u>6,140.00</u>	6,200.00
(13)	<u>Wade Creek</u>	1, 70' King Truss	3,000.00	
		102' trestle at \$30.00	3,060.00	
		2, pile piers at \$1,200.00	2,400.00	
			<u>8,460.00</u>	8,500.00
(14)	<u>12' Creek</u>	1, 60' King span	2,500.00	
		68' trestle at \$30.00	2,040.00	
		2 pile piers at \$800.00	1,600.00	
			<u>6,140.00</u>	6,200.00
(15)	<u>Feathers Creek</u>	1, 60' King span	2,500.00	
		68' trestle at \$30.00	2,040.00	
		2 pile piers	1,600.00	
			<u>6,140.00</u>	6,200.00
(16)	<u>Drift Pile Creek</u>	1, 70' King span	3,000.00	
		102' Trestle at \$30.00	3,060.00	
		2 pile piers at \$1,200.00	2,400.00	
			<u>8,460.00</u>	8,500.00
	<u>Secondary Bridges</u>	7 - 20' spans	3,000.00	
		1 - 25' spans	500.00	
		3 - 30' spans	2,000.00	
			<u>5,500.00</u>	5,500.00
		Portable Mill - delivered and assembled	11,000.00	
			<u>339,300.00</u>	
		Contingencies, 11 per cent	42,693.00	
			<u>381,993.00</u>	
		Practically -	<u>\$382,000.00</u>	

## ALASKA - BRITISH COLUMBIA HIGHWAY RECONNAISSANCE, 1939

Memorandum on Secondary Structures and Culverts

Miles No	Bridges			Corrugated Iron Pipe					Wooden Box Culverts				
	Common			12"	18"	24"	30"	36"	48"				
1 - 5				5	5	1				1			
5 -10	1			14	10		1	1			1		
10-15	1			7	4								
15-20	1			11	6	1				1			
20-25				9	5		2			2			
25-30				6	3								
30-35				12	5					2			
35-40	1			6	1						1		
40-45				8	2								
45-50				6	4		3						
50-55				9	5	1				1			
55-60				8	1					1			
60-65				10	2								
65-70				10									
70-75				10	1								
75-80				15	2	2							
80-85	1			6	4	1				1			
85-90				10	1	2				1	1		
90-95				4	4	1							
95-100	1			6	2					1			
100-105				10	1	3				1			
105-110			2	8	3	2					1		
110-115			1	6		4					1		
115-120	1	1		4	1	4		1					
120-125				8	1								
125-130				10	1	3							
130-135				13	3	1				1			
135-140				13	3	1							
140-145				13	3	1							
145-150				10	3	1	1			1			
150-155				12	2	1	1				1		
155-160				13	2	1	2				1		
160-165				12	4	2	2						
165-170				11	2	2		1			1		
170-175				10	2								
175 -				10	3	4	3				2		
				325	102	39	15	3		8	16	1	1

Total Lineal feet culverts required	Corrugated Iron Pipe	Cost per 30 lin.ft	Estimated Cost
	12" "	\$11,750	12" 24,000.00
	18" "	4,080	18" 13,000.00
	24" "	1,640	24" 7,000.00
	30" "	750	30" 4,000.00
	36" "	150	36" 1,000.00

Wooden Box Culverts

Total lineal feet	200, 800, 50 and 50	Total estimated cost :
Estimated cost of same	\$1000 and \$5000	\$55,000.00

Note: Figures compiled by K. Ford based on data collected by him recently on Columbia River Big Bend Highway construction.



<u>File</u>	<u>Distance</u>	<u>Quantities</u>	<u>Clearing Grubbing</u>	<u>&amp; Surfacing</u>	<u>T o t a l</u>
1 - 63	63	655,000 at 62 $\frac{1}{2}$	1,500.00	2,000.00	629,875.00
64	1	15,000 at \$1.25	"	"	22,250.00
65 - 145	81	868,000 at 62 $\frac{1}{2}$	"	"	826,000.00
146-147	2	30,000 at \$1.25	"	"	44,500.00
148-151	4	40,000 at 62 $\frac{1}{2}$	"	"	39,000.00
152	1	15,000 at \$1.25	"	"	22,250.00
153-179	27	325,000 at 62 $\frac{1}{2}$	"	"	297,625.00
					<u>1,881,500.00</u>
					\$1,881,500
		Less 7 miles 70,000 at 62 $\frac{1}{2}$ plus Clearing, grubbing and surfacing			68,250.00
					<u>1,813,250.00</u>
					\$1,813,250
		Plus for Dease River to Lower Canyon on Liard, total 8 miles:			
		8 miles 40,000 yards at 62 $\frac{1}{2}$ plus clearing, grubbing and surfacing			
					32,000.00
		" " " " " "			42,500.00
		" " \$1.25 " "			22,250.00
					<u>96,750.00</u>
					\$1,910,000

Note: 62 $\frac{1}{2}$  cents a yard is estimated for ordinary excavation; \$1.25 a yard where 40 per cent is rock. (The rock appears to be generally of a schistose nature, comparatively easy to break)

Clearing is estimated for a 66 foot right-of-way; grubbing, 30 feet.

Excavation, clearing, Grubbing and surfacing	\$1,910,000.00
Bridges from previous page (as amended by A.L. Barruthers)	382,000.00
Bridges and culverts, Liard and Dease Rivers	3,000.00
Culverts	55,000.00
	<u>\$2,350,000</u>
This for 180 miles -	\$13,056.00

Note: The earthwork is based on a 30-foot, overall, roadway and a maximum grade of 6 per cent, estimated from two or more typical sections (half a mile in length) en route. It is considered that the above is a fair estimate of probable costs.

Some spruce in isolated patches is available and would be satisfactory for local lumber - camp purposes, small structural timbers and piling. Such timber is found near Mile 42, near the confluence of the Kachika and Burnagain rivers, in the vicinity of Denatiah Creek and Frog River and other localities in the Trench. No amount for engineering services is included in the above figures. \$100,000 for such services would bring the above total to say

\$2,450,000

Memorandum of Freight Rates

Telegraph Creek to Dease Lake (road)	3½ cents per pound
Dease Lake to Lower Post	6 " " "
Prince George to Fort Ware	7 " " "

P a s s e n g e r s

Wrangell to Telegraph Creek - \$30 up stream; \$15 down stream

Telegraph Creek to Dease Lake \$5

Dease Lake to Lower Post (up or down stream) \$20

Pack and saddle horses at Telegraph Creek, \$1.25 per day, fully equipped, usually with apparajos for pack animals.

Pack and saddle horses at Hudson Hope, Peace River or Stuart Lake, 75 cents to \$1.00 per day; usually with pack saddles for pack animals.

Comparison of Prices at Telegraph Creek, Lower Post and Fort Ware

<u>Commodity</u>	<u>Telegraph Creek</u>	<u>Lower Post</u>	<u>Fort Ware</u>
Bacon per pound	.50	.80	.65
Beans "	.13	.23	.20
Butter "	.55	.65	.60
Coffee "	.55	.70	
Dried Fruit "	.30	.40	.35
Flour "	.07	.16	
Rice "	.10	.20	.17½
Salt "	.08	.20	.18½
Sugar "	.11	.20	
Tea "	.70	.90	
Gasoline, per gallon		1.50	

WEATHER REPORT - 1939

<u>Date</u>	<u>Location</u>	<u>General Conditions</u>	<u>Wind</u>	<u>Temperature</u>
June 15	Dease Lake	Fine, frost at night	S.W.	30 at 6 a.m.
" 16	"	Fine, warm		25 at 4 a.m.
" 17	"	Rain in p.m.		60 at 8 a.m.
" 18	"	Cloudy, showery, cool		54 at 7 a.m.
" 19	"	Clearing	North	55 at noon
" 20	"	Cloudy, cool		50 at noon
" 21	"	Rain	S.E.	60 at noon
" 22	Dease River	Fine, partly cloudy, cool		52 at noon
" 23	"	Rain. Cloudy to fine		60 at noon
" 24	Lower Post	Fine		45 at 7 a.m.
" 25	"	Showery		52 in a.m. and p.m.
" 26	"	Fine, warm, showery		52 in " "
" 27	"	Showery		60 at noon
" 28	"	Fine. High wind	E.	65 at noon
" 29	"	Fine. High wind	E.	72 at noon
" 30	"	Rain		52 at 8 a.m.
July 1	Lower Post	High wind. Rain	W.	40 at 8 a.m.
" 2	"	Fine. High wind	W.	50 "
" 3	"	Rain		50 "
" 4	"	Fine		52 "
" 5	"	Fine		52 "
" 6	"	Showery		52 "
" 7	"	Fine to rain		50 "
" 8	"	Fog. Heavy dew		45 "
" 9	"	Fine		55 "
" 10	12 Miles S.E.	Fine. Cloudy		56 "
" 11	"	Showery		58 at noon
" 12	"	Showery, windy	S.E.	58 at noon

<u>Date</u>	<u>Location</u>	<u>General Conditions</u>	<u>Wind</u>	<u>Temperature</u>
July 13	29 Miles S.E.	Rain to Fine		33 at 10 p.m.
" 14	"	Cloudy to fine		27 at midnight
" 15	37 " S.E.	Showery		47 at 6 a.m.
" 16	Red River	Fine. One shower		48 at 6 a.m.
" 17	"	Fine		82 at noon
" 18	"	Cloudy to fine		
" 19	54 Miles S.E.	Fine. One shower		50 at 6 a.m.
" 20	"	Fine. Cloudy		86 at 2 p.m.
" 21	"	Fine	E.	52 at 7 a.m.
" 22	"	Fine. Sultry		54 at 8 p.m.
" 23	"	Cloudy. Windy. Fine	S.W.	65 at noon
" 24	Kachika River	Cloudy. Showery	W.	52 at 8 p.m.
" 25	Chee House	Fine		54 at 7 a.m.
" 26	"	Fine		44 "
" 27	"	Fine		48 "
" 28	"	Fine to cloudy		45 "
" 29	"	Cloudy, one shower		50 "
" 30	"	Showery		60 at noon
" 31	"	Cloudy		45 at 7 a.m.
August 1	Chee House	Cloudy. Windy	W.	45 at 7 a.m.
" 2	"	Cloudy, fine		52 "
" 3	"	Partly Cloudy		44 "
" 4	6 miles south	Fine, windy		38 "
" 5	"	Cloudy, one shower		42 "
" 6	"	Fine, partly cloudy		60 at noon
" 7	12 "	Partly clear, fine and warm		38 at 6 a.m.
" 8	20 "	Fine		45 at 6 a.m.
" 9	"	Fine, warm		85 at noon
" 10	"	Fine, warm		80 at noon
" 11	25 "	Cooler. Thunder. Rain at night		47 at 6 a.m.



<u>Date</u>	<u>Location</u>	<u>General Conditions</u>	<u>Wind</u>	<u>Temperature</u>
August 12	25 miles south	Cold. Rain		42 at 6 a.m.
" 13	"	Rain to clear. Cool		42 at 6 a.m.
" 14	35 "	Showery and cool		37 at 6 a.m.
" 15	"	Showery, cool	S.E.	37 at 6 a.m.
" 16	40 "	Showery, windy, cool		42 at 6 a.m.
" 17	"	Showery and cool		60 at noon
" 18	"	Showery to fine		24 at 4 a.m.
" 19	"	Showery, windy		52 at 6 a.m.
" 20	"	Fine; one shower		
" 21	"	Fine		48 at 6 a.m.
" 22	48 "	Fine. Cool		48 "
" 23	60 "	Fine. Cool		
" 24	"	Showery, cool.		42 at 6 a.m.
" 25	Frog River	Showery, cold		54 at noon
" 26	"	Fine		34 at 6 a.m.
" 27	"	Fine		25 at 6 a.m.
" 28	"	Fine		32 at 6 a.m.
" 29	13 miles south	Cloudy, calm		38 at 6 a.m.
" 30	26 " "	Cloudy, rain at night		42 at 6 a.m.
" 31	" "	Cloudy, fine		36 at 6 a.m.
Sept. 1	36 miles south	Cloudy; rain in p.m.		30 at 6 a.m.
" 2	48 " "	Cloudy, showery		45 "
" 3	Sifton Pass	Cloudy, showery	S.E.	30 "
" 4	" "	Cloudy, showery		34 at 6 a.m.
" 5	Fox Lake	Cloudy to fine		28 at 6 a.m.
" 6	Fox Pass	Showery, cold		25 at 6 a.m.
" 7	37 miles south of Sifton Pass	Fine, windy	S.W.	36 at 6 a.m.
" 8	Fort Ware, Firley River	Fine, partly cloudy		25 at 6 a.m.

Notes on Bird Life

Many varieties of birds were observed during the summer. Of the wild-fowl, loons (the Great Northern Diver), snipe, plover, Canada geese, many kinds of ducks and a few herring gulls and terns were seen. A few geese evidently nest in the region.

Owls do not appear to be plentiful and we seldom heard and rarely saw them, but there are some Golden Eagles, many sparrow hawks, some marsh hawks and a few falcons - probably the peregrine. We saw, I think, one osprey. American crows and ravens are fairly numerous.

Willow grouse and spruce partridge are common, though not particularly plentiful, and ptarmigan are found on the higher levels.

Of the smaller birds, we saw robins, red-winged blackbirds, cow birds, woodpeckers, flickers, varied and olive-backed thrushes, northern wrens, juncos, American water-ouzels, sparrows, western tanagers, yellow warblers, night-hawks and two or more flocks of cedar waxwings, one flock near the Lower Post early in July. Canada jays (whiskey jacks) of course are numerous, and so were the bank swallows which were busy nesting under the eaves of buildings at McDames and the Lower Post.

List of Plants from Liard Basin, 58-60 N.Lat; 127-130 W.Long.Lower Post - Liard River to Sifton Pass

Achillea Millefolium	Galium Sp., Boreale	Pyrole Chlorantha
Allium Schoenoprasum	Gentiana Propinqua	Rosa. Sp.?
Anemone Multifida	Larix Americana	Rubus Arcticus
Aquilegia Brevistyla	Ledum Groenlandicum	Saxifraga Tricuspidata
Arnica Sp.?	Linnaea Borealis	Senica. Sp.?
Artemisis Frigida	Lonicera.? Lupinus	Solidago Elongata
Astragalus Sp.?	Lupinus	Tofieldia Intermedia
Campanula Rotundifolia var.	Mertensia	Vaccinium Oreophyllum
Delphinium Sp.?	Oxytropis Monticola	Vaccinium Vitis-idaea?
Erigeron Compositus	Polemonium Coeruleum	Viburnum Pauciflorum
Eriophorum	Potentilla Fruiticosa	Zygadenus Elegans.

Note: The names of the above plants were kindly given by Prof. J. Davidson, Associate Professor of Botany, University of British Columbia.

List of Plans Accompanying Reconnaissance  
Report by E. Lamarque

1. Plan - Northerly end of "B" Route - scale 16 miles to 1 inch
2. Plan of Upper Liard River and adjacent territory - scale 16 miles to 1 inch
3. Plan of Lower Post and vicinity - scale 2,000 feet to 1 inch
4. Map of reconnaissance survey, "B" Route, Liard river to Sifton Pass - four miles to 1 inch
5. Plan of Fort Ware to Caribou Hide - scale 4 miles to 1 inch
6. Sample topography and location near Mile 12
- 6a. Sample cross sections for above
7. Sample topography and location near Sifton Pass
- 7a. Sample cross sections for above
8. Trail traverse, Lower Post to Sifton Pass - 1,000 feet to 1 inch.

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Note. Some fifty photographs also accompanying the Report are filed with the records of the British Columbia - Yukon - Alaska Highway Commission.